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Feuille III (Madagascar et Dépendance). Scale, 1:5,000,000, or 78.9 statute miles to an inch. Hachette & Co., Paris, 1905.

The map is based upon the large-scale maps published by the Geographic Service of the French Army between 1889 and 1903. This more exact information, generalized and finely engraved on steel, results in the best atlas sheet of Madagascar up to this time. There are three insets: the central part of Madagascar from the Indian Ocean inland on a scale of 1:1,250,000, or 19.7 statute miles to an inch; the island of Réunion on the same scale, and the French Somali coast on the same scale as that of the main sheet.

BOOK NOTICES.

Das Alter der wirtschaftlichen Kultur der Menschheit. Von Ed. Hahn. Heidelberg, Carl Winter's Universitätsbuchhandlung, 1905. 246 pp. (Pr., M. 6.80.)

Students of the history of primitive man will find many interesting contributions to their science in this book, which represents a summary of the life-work of the author in this line. One of his main objects is to disprove the traditional idea of an evolution of the human race through the stages of hunter, herdsman or nomad, and agriculturist. While the fact remains that these stages of culture have alternated at different periods in the history of primitive man, the results of modern ethnology no longer allow the acceptance of their universal succession in the order named.

The first observation which spoke against this popular tradition was made by Alexander von Humboldt, who found that almost all the native tribes of South America practised some form of agriculture, while, with the single exception of the Incas, no attempts at the domestication of animals were ever observed. The author's own studies of domestic animals and the history of their domestication corroborate Humboldt's statements.

In speaking of domestication, especially of that of cattle, two aspects of the question must be kept apart—viz., the use of the animal as draught cattle or as carriers of burdens in general and as producers of food, especially of milk. The negroes of Central Africa, for instance, keep large herds of cattle for the sake of their milk, but never thought of using them to draw or carry anything before the arrival of the whites. They, too, like the South American tribes, have some agriculture without ever having put an animal to the plough. This and similar observations lead the author, with Ratzel, to distinguish two entirely separate forms of agriculture by the names of hoe-culture and plough-culture. The former is the one found with primitive peoples all over the globe; it consists in the planting of seeds or roots by means of simple tools of a more or less hoe-like shape. The plants, or clusters of plants, grow in small hillocks, which may be heaped up more or less regularly; and while the land thus cultivated may, when laid out with some care, present an appearance not very different from a regular field, it will upon closer investigation always be characterized by the entire absence of furrow-lines. A field under plough-culture will, on the other hand, always be characterized by the conspicuous lines drawn by the plough, which means that man has discovered the secret of enlisting the strength of an animal and of using a mechanical device in order to avoid the hardship of manual labour which is connected with hoe-culture. Plough-culture is, therefore, found exclusively with races possessing an old and highly-developed civilization. Whenever the word "agriculture" has been used so far, it has been synonymous with plough-culture, which, without the other, is indeed the highest of the culture stages. In the new understanding it can no longer be used to denote this stage; for, as hoe-culture, it stands at the beginning of all civilization.

Upon this basis, the author's results are, in short, as follows: Taking the use of fire as the starting-point of civilization, the first modification of the traditional scheme must be made concerning the hunter stage. Hunting presupposes a definite purpose and plan to secure possession of some game, which is more than can be expected of primitive man at his start. The study of the lowest races of the present rather shows that in this stage man gathers whatever comes in his way and seems fit to eat, animal or vegetable alike. Thus the gathering stage preceded that of the hunter, and remnants of the same are still found among the aborigines of Australia. At a later stage a division of labour takes place. Man goes out to get the game, but he is far from living on flesh food exclusively; he charges the women of the tribe to get the vegetable contribution to the meals. In proportion as he, from a mere gatherer, rose to the stage of hunter, woman was by this division of labour made the first agriculturist; hoe-culturist. Half-eaten roots covered with earth, together with other remnants of meals, or roots and fruit buried in the ground as offerings for the dead, would sprout and grow, and thus eventually teach the women how to secure vegetable food with less trouble. Consequently, wherever agriculture (*sc.*, hoe-culture) is found with primitive peoples, it is the women who till the soil, while the men hunt, go to war, or do nothing.

Many evidences furnish proof that also in the parts of the world now given over to plough-culture, the latter was preceded by hoe-culture in primitive times. Its main product was millet, the venerable old food-stuff, which figures in all the Germanic folk-lore as the national food, and forms the contents of the magic boiler which is never empty. Its almost universal propagation, from the polar circle to the subtropics, would alone speak for its age; but there is also unquestionable evidence of its cultivation among the relics of the lake dwellers. To-day millet is hardly known as a food-stuff to the people at large, and in its place we pray for our daily bread—one of the most graphic illustrations of the supplanting of the hoe by the plough.

Concerning the transition, too, from the hunting to the nomadic and from the nomadic to the plough-culture stage, important modifications must be made. The familiar idea of man having been attracted by the cow's milk, and having, therefore, begun to keep cattle, after which he started putting the ox to the plough, must almost completely be abandoned. Even if there were not the difficulty of taking a product which is the result of domestication as the cause of the same, two most important civilizations stand out as unmistakable proofs of the fallacy of the milk theory. The first is China, where from time immemorial the ox has been the helper of the ploughman, but where nobody has ever seen a native touch milk; the other is ancient Peru, where the only domestic animal of prehistoric America was bred; while there is not even the record of an attempt to milk the llama.

Turning again to the primitive nations of the present to furnish us a key for the past, the author finds a more probable incentive for the domestication of animals in the love of pets found with certain primitive tribes. According to von den Steinen, for instance, the homes of the Indians of central South America are zoological gardens on a small scale, so full are they of animal playmates of their inhabitants. In a similar way the smaller of our present domestic animals—the dog, sheep, and goat—were probably first chosen for companions of man, and their confinement would not be so close as to prevent them from breeding, the main difficulty encountered in the study of the beginnings of domestication being that animals suddenly deprived of their liberty will not breed. In proportion as man became familiar with the characteristics of the different animals he would find out that they were good for more than mere comradeship, and use them as carriers of burdens, and the experience acquired in contact with the smaller animals enabled him to experiment also with the larger ones—the donkey, the camel, the horse, etc. With those at his command, the development of nomadic life was only a question of time.

Even nomads, however, did not live on the flesh or milk of their herds exclusively, but on their respective halts set the women's hoes to work to furnish the supplementary dishes, or preyed upon the neighbouring agricultural (*sc.*, hoe-cultural) tribes for vegetable contributions. Thus agriculture, far from following the earlier stages, is, in the form of hoe-culture, contemporaneous with each, and actually the oldest of any culture recorded.

The surprising fact (which cannot be denied, in face of the author's evidence) is that the plough-culture has nowhere developed from hoe-culture. The use of the plough drawn by the ox or horse appears as something entirely novel, and radically incongruous with anything that preceded it. So wide is the gap between the two stages that to the Greeks nothing short of a miracle could explain the invention of agri-(*sc.*, plough-)culture, and modern science, too, has as yet been unable to bridge it over. Wherever plough-culture now takes the place of the older form, it must have been introduced as an entirely foreign element, originated, perhaps, many thousand miles away on an area especially adapted to its development, and spread from there over its present area, supplanting the hoe by the plough, and the hoe-products by the cereals.

The author looks upon Babylonia as the original centre, and his argumentation is as follows: The foundations of plough-culture are twofold—the invention of the plough, and the putting the ox to it. The plough cannot have been the first vehicle to which the ox was put, as an animal which is yet to be broken in will never cut a straight furrow. The ox must have been accustomed to harness-work before he was made to plough—in other words, the chariot or the wheeled vehicle must have preceded the plough.

Ths author traces the invention of the wheel back to the old forms of worship in which the idols were carried in processions. When they proved too heavy for the carriers, they were drawn along, and wheels attached to the statues. To raise them high above the crowd, they were placed on platforms with wheels attached to them: the first chariots. When the priests who originally hauled the vehicle came to be replaced by a draught animal, the ox was chosen because he was sacred. It is well known what an important part the moon played in the religion of Babylonia , and the resemblance of the horns of ox and cow to the crescent was early noted. Herds of cattle, therefore, were early kept in enclosures near the temples, in Babylonia as well as in other countries, and this was the first step at domesticating cattle. Cow's milk, as a sacred fluid, was consecrated to the gods as food in the regular offerings, just as bread was offered in the Hebrew cult (an interesting instance how precious, and therefore new, the product of plough-culture must have been in Palestine when the Mosaic laws were given). We know who, in fact, ate similar offerings, and very probably it was through the priests that the use of milk was established among the people. When it came to choosing a draught animal for the sacred chariot, none could be better suited for the purpose than the ox, already attached to the service, and probably fitted for it by a special consecration, as in other cults. In this way the ox was trained to harness, and the subsequent putting it to the plough was a natural step.

The invention of the latter, too, can be derived from a religious act. The first ploughing was probably a kind of consecration of the soil, a symbolical fertilisation of the field. The loosening of the soil by the sacred animal would naturally bring better results than that done by an ordinary mortal; thus the hoe was attached to the ox, and, changing its vertical position to a horizontal one, the first primitive plough ripped the earth and cut the first furrow. In a hard-baked soil, such as the rich alluvial bottom-lands form in a climate like that of Babylonia, the difference between the vegetation along the lines of loosened soil and that on the hard stripes between will soon show, and thus the Babylonian farmer learned the lesson of planting his seeds in the furrows.

The geographical condition of the land of its origin is responsible also for another characteristic of plough-culture. In a steppe climate, agriculture is possible only through irrigation; and we know what was done in this line in Babylonia. But irrigation requires farming on a large scale—a combination of the individual fields into one large area, over which the water is conducted. Such space was not available in the city; the fields had to be far away from the homes, outside the city walls. There women could not be allowed to work, and thus plough-culture grew up as man's work; while hoe-culture, which could be pursued near the home, was the work of the women. Thus it comes that all over Europe, among the old resident farmer population who preserve the traditions of their fathers, the farmer takes care of, and sells, the products of the fields, while the wife has the care and income of the vegetable and fruit garden, the only part of farming in which hoe-culture has survived to the present.

It has been considered desirable to give the book a more detailed review than is generally accorded to books of its size, because it is not very probable that it will find many readers in this country, on account of the crabbed and difficult German in which it is written. While literary perfection is not the foremost requirement of a scientific book, neglect of clearness has certainly been carried too far in this instance. Not only is the style one of the best illustrations of the ill-famed " Gelehrten-Deutsch," which it requires a special effort even for the native to read, but the presentation of the subject is also interspersed with so many digressions of a personal or political nature that the unity of the plan is entirely destroyed. A revision from these points of view before another edition is made would certainly contribute very effectively to secure for the author a wider recognition of his work. He now complains of the lack of this recognition, which he fully deserves. M. K. G.

Explorations in Turkestan, with an Account of the Basin of Eastern Persia and Sistan. Published by the Carnegie Institution, Washington, 1905.

This fine volume embodies the results of an expedition in 1903, under the direction of Professor Raphael Pumpelly, who was assisted by Professor W. M. Davis,